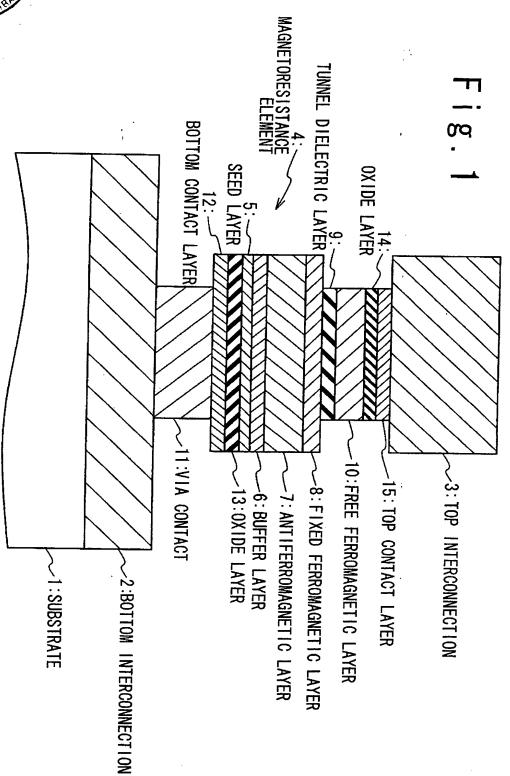


Yoshiyuki FUKUMOTO et al.

"Magnetoresistance Device and Method of
Fabricating the Same"

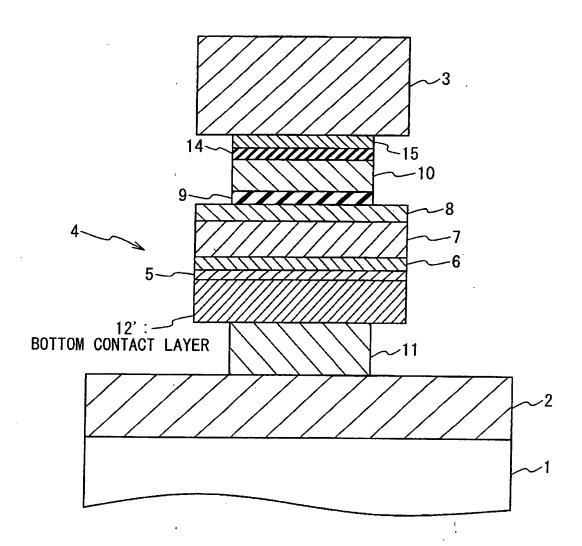
Q78162----Filed October 31, 2003

Sheets____ of 40



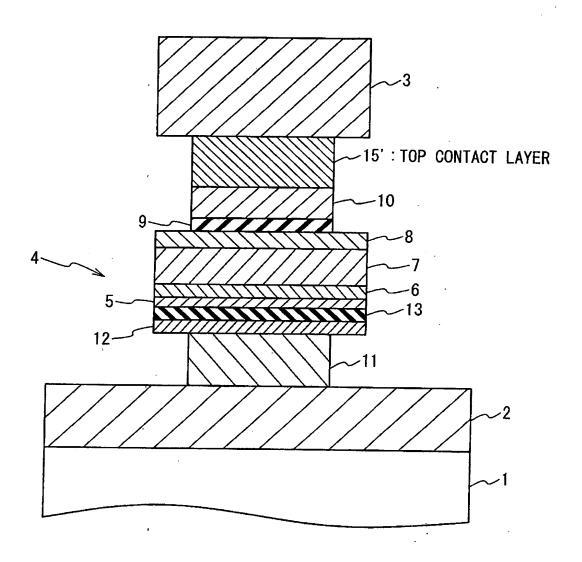
Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets 2 of 40

Fig. 2

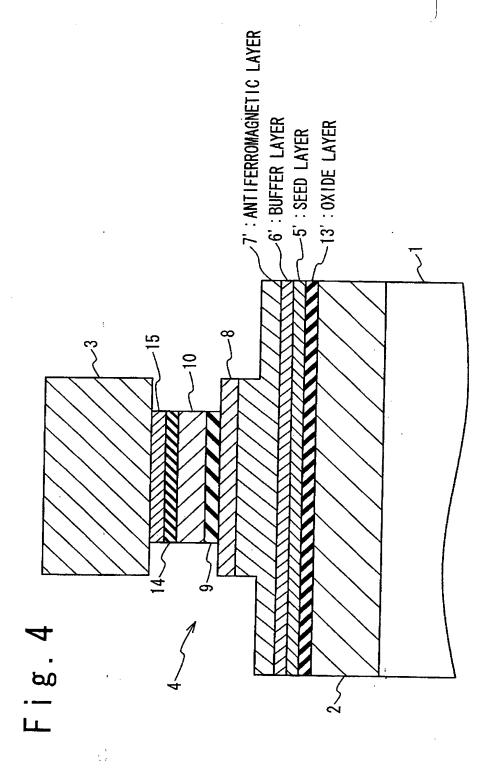


Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets <u>3</u> of 40

Fig. 3



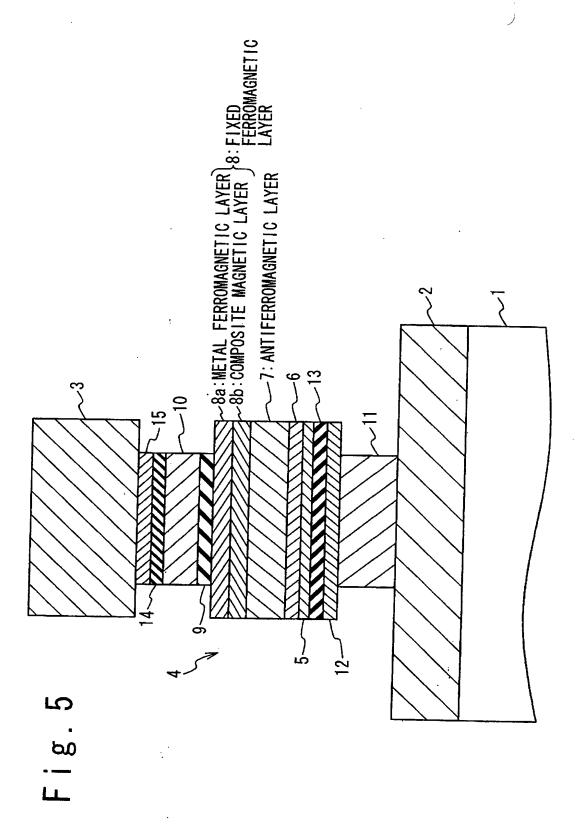
Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets_4_ of 40



Yoshiyuki FUKUMOTO et al.

"Magnetoresistance Device and Method of
Fabricating the Same"

Q78162----Filed October 31, 2003
Sheets_5_ of 40



Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets 2 of 40

Fig. 6A

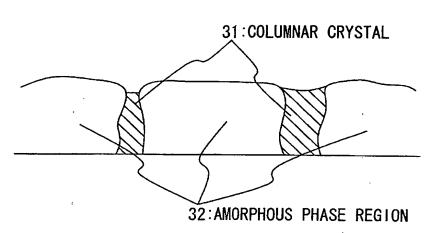
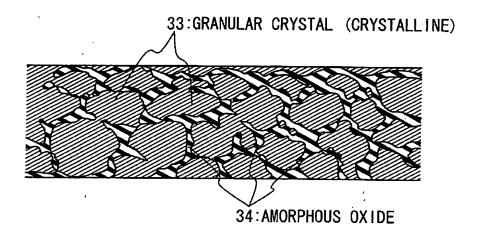


Fig. 6B

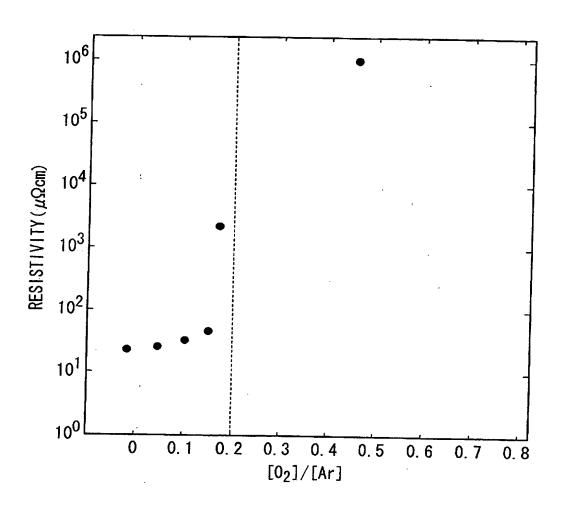


Yoshiyuki FUKUMOTO et al.

"Magnetoresistance Device and Method of
Fabricating the Same"

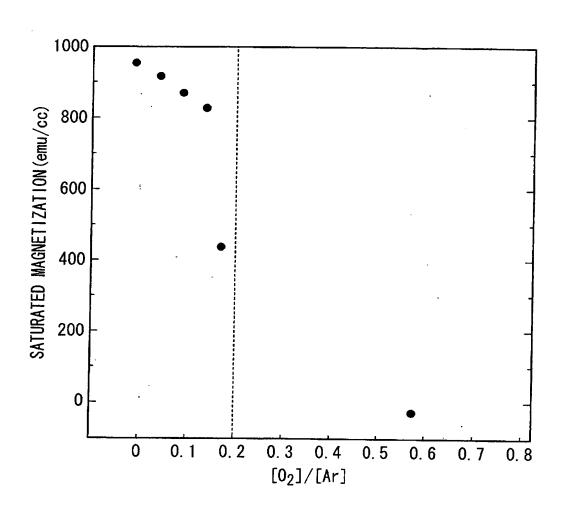
Q78162----Filed October 31, 2003
Sheets____7_ of 40

Fig. 7



Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets_8 of 40

Fig. 8

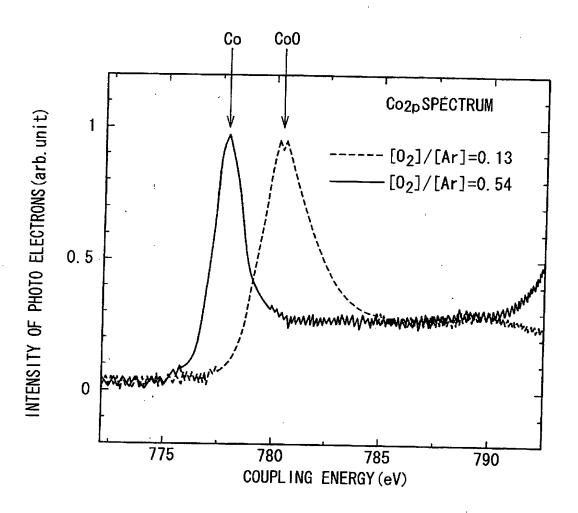


Yoshiyuki FUKUMOTO et al.

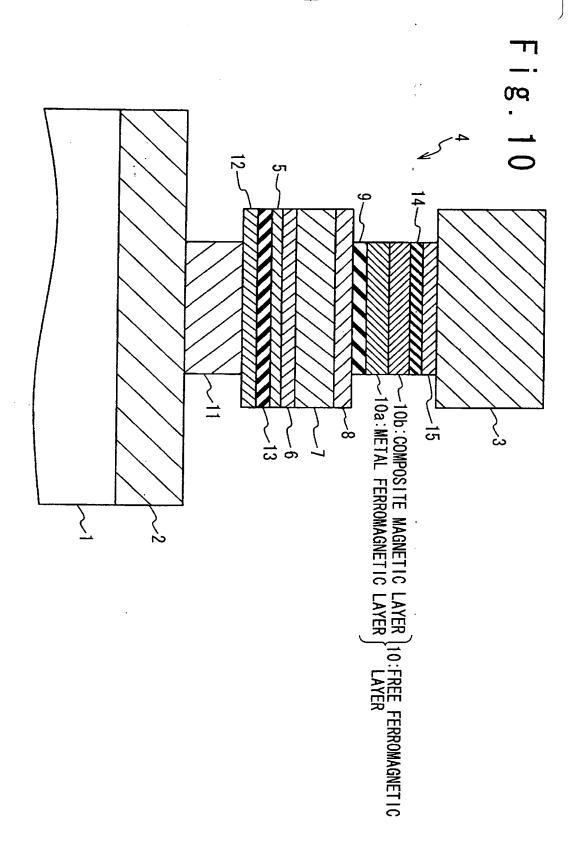
"Magnetoresistance Device and Method of
Fabricating the Same"

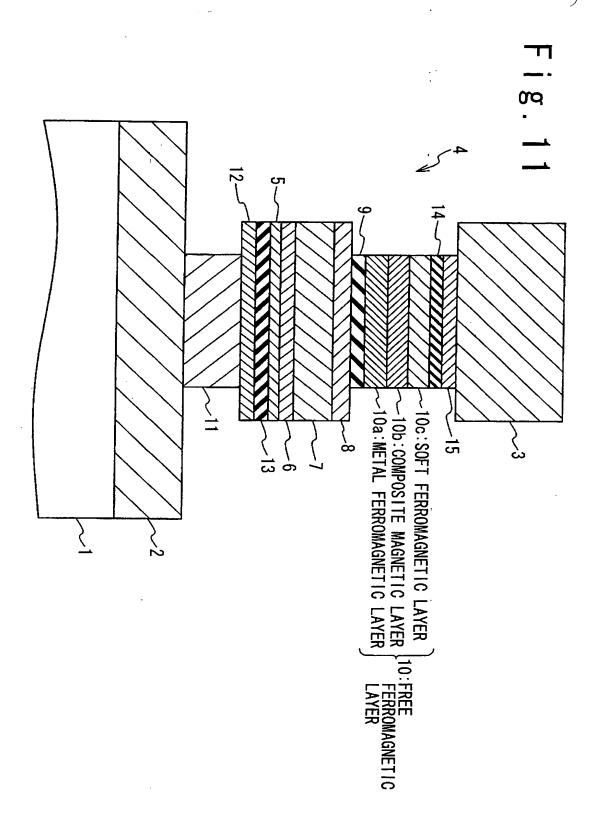
Q78162----Filed October 31, 2003
Sheets _____ of 40

Fig. 9

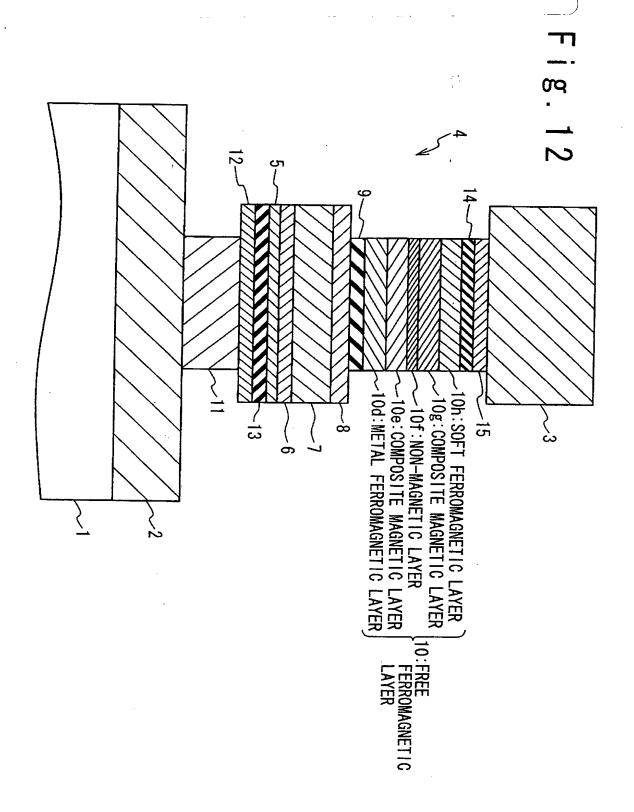


Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets_/0_ of 40

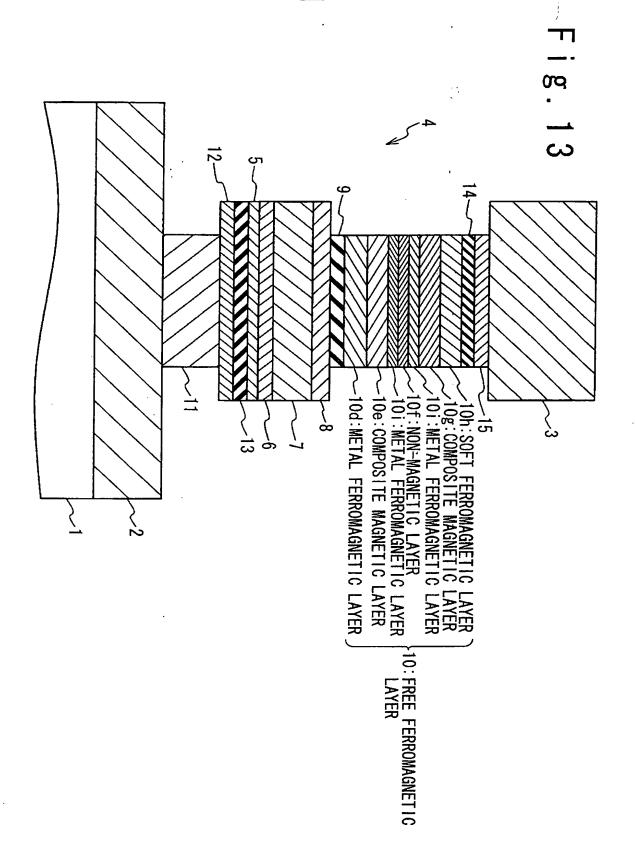




Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets 12 of 40



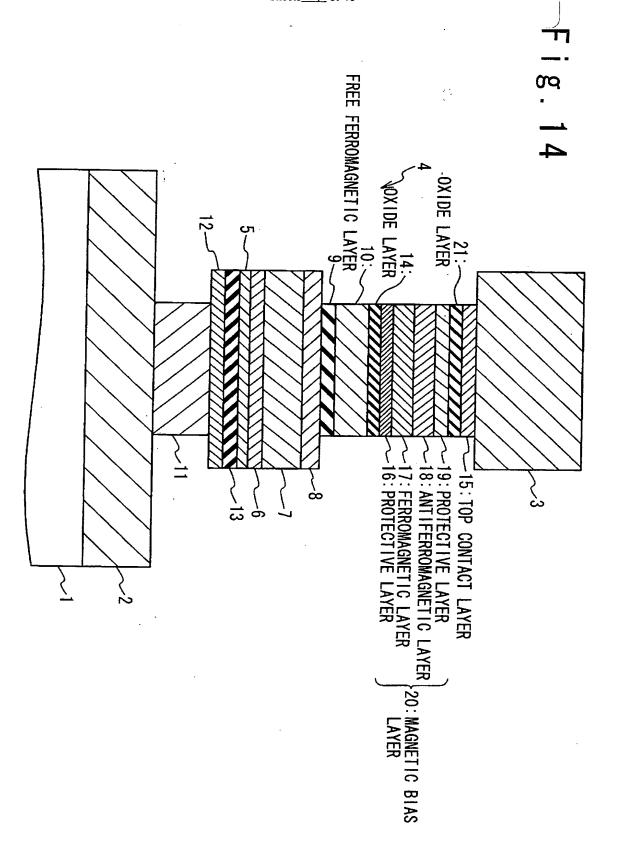
Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets 13 of 40



Yoshiyuki FUKUMOTO et al.

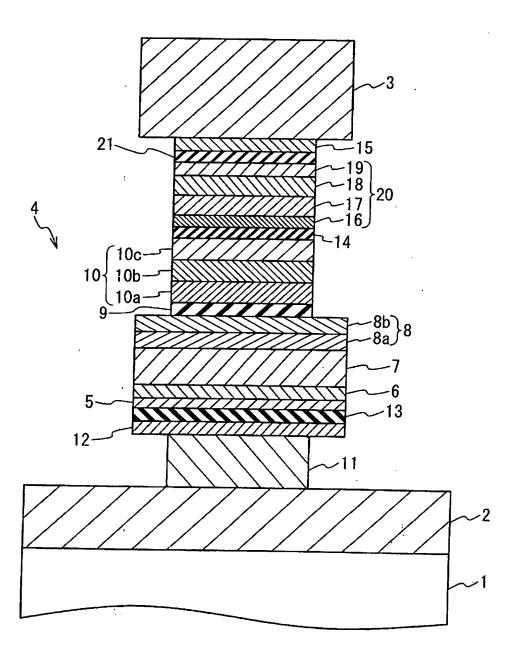
"Magnetoresistance Device and Method of
Fabricating the Same"

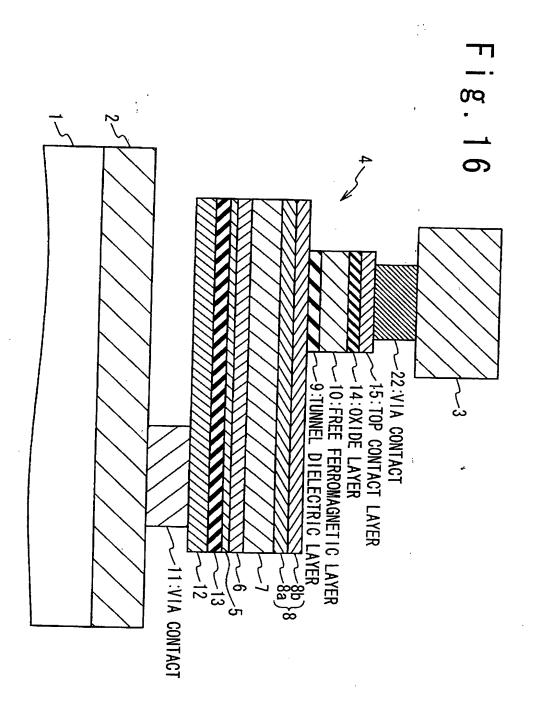
Q78162----Filed October 31, 2003
Sheets 14 of 40

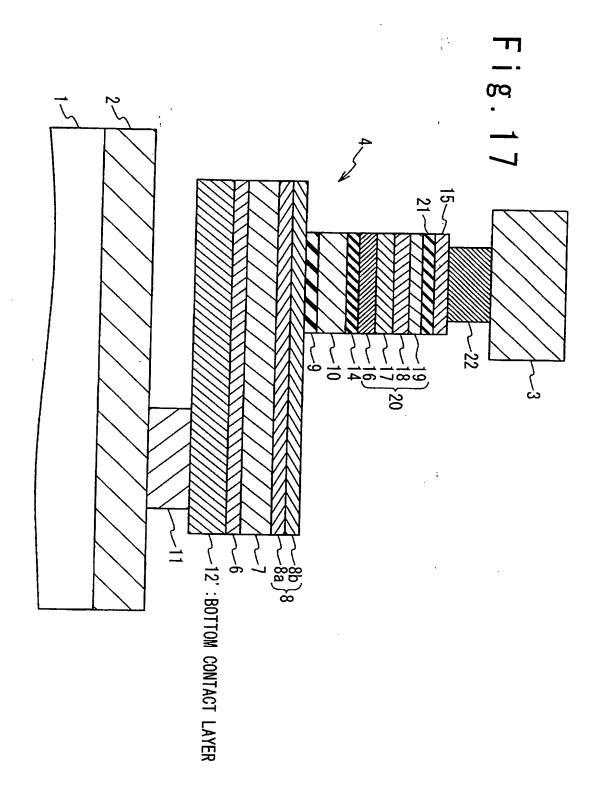


Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets 15 of 40

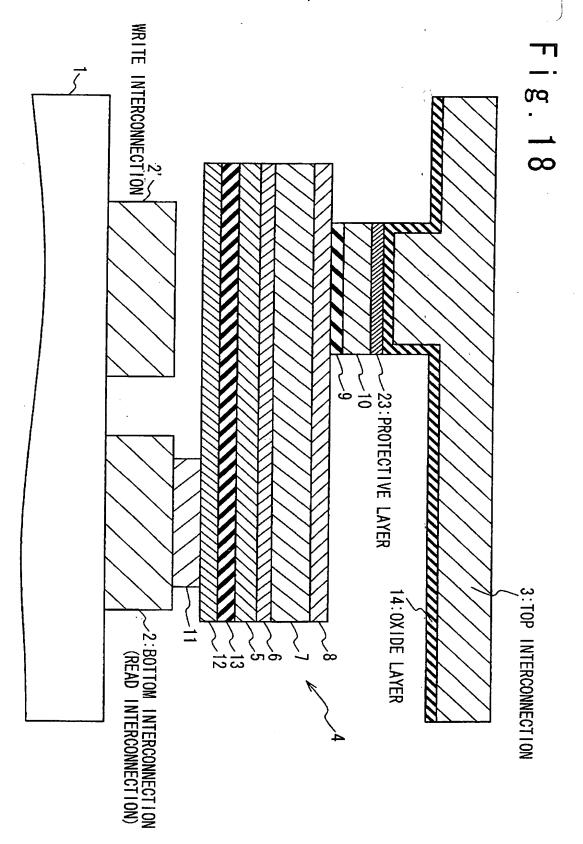
Fig. 15







Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets 16 of 40



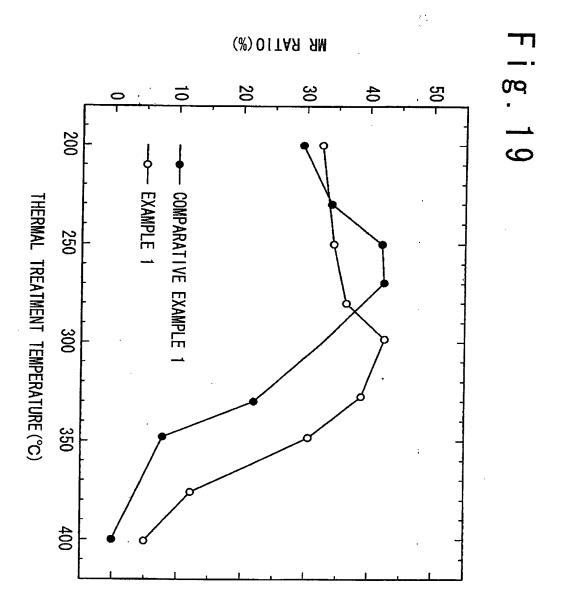
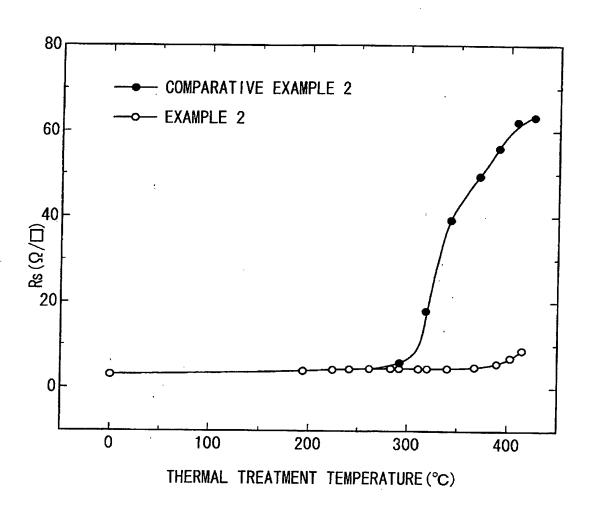


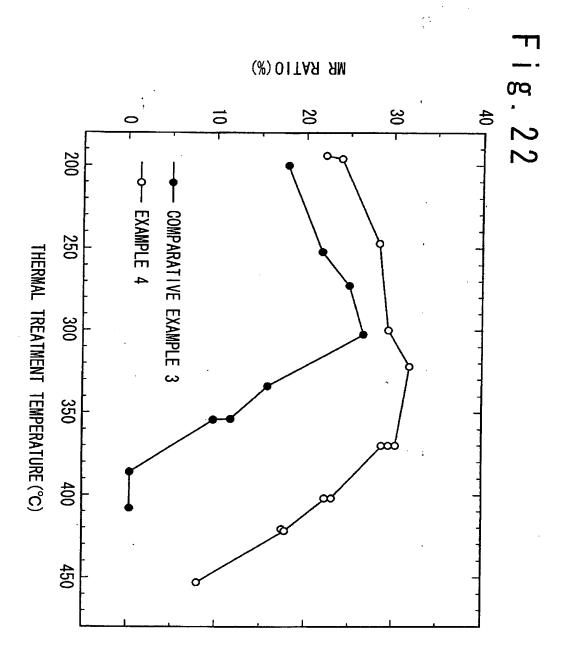
Fig. 20



Yoshiyuki FUKUMOTO et al. "Magnetoresistance Device and Method of Fabricating the Same" Q78162----Filed October 31, 2003 Sheets 2/ of 40

EXAMPLE EXAMPLE 2 ယ Al₂0₃ (1nm) Mgo (1nm) 8 THERMAL TREATMENT TEMPERATURE AND RESISTANCE AFTER THERMAL TREATMENT 4. 3 **4**. 5 300°C 6.2 4. 2 . . '2 350°C 44. 3 4. . တ 400°C 53. 5 5 5

+ i g. 21



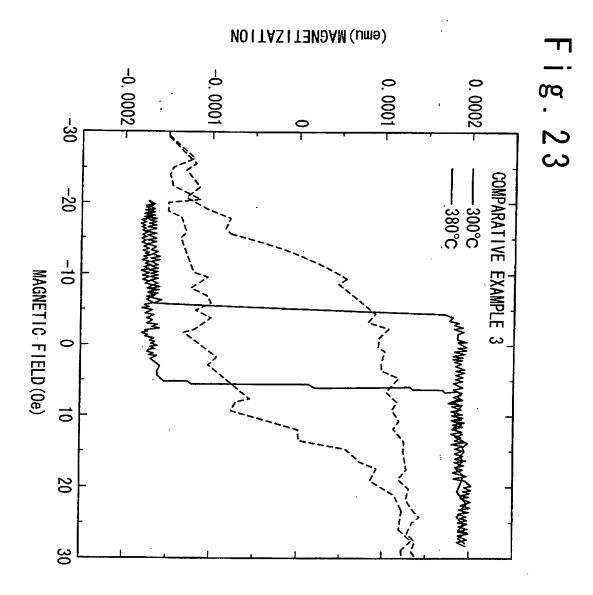
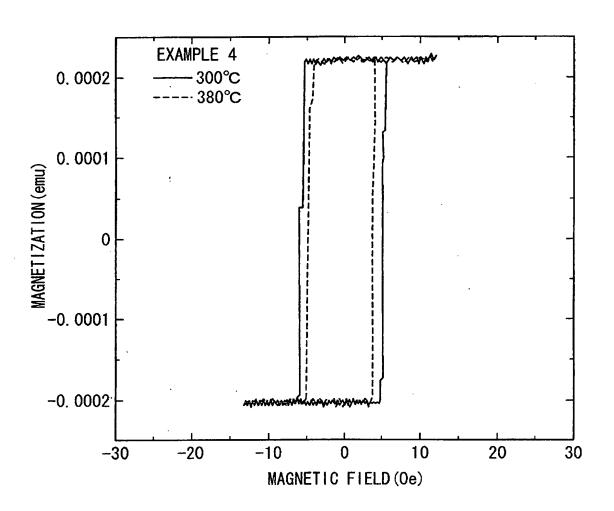


Fig. 24

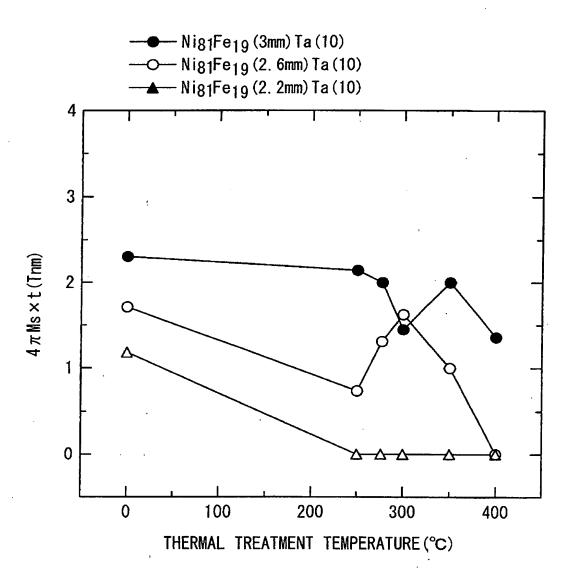


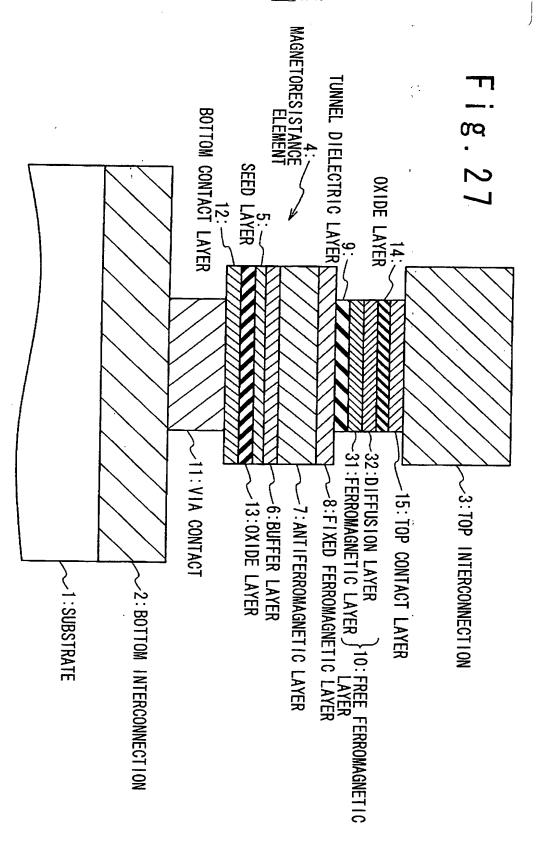
Yoshiyuki FUKUMOTO et al. "Magnetoresistance Device and Method of Fabricating the Same" Q78162----Filed October 31, 2003 Sheets <u>25</u> of 40

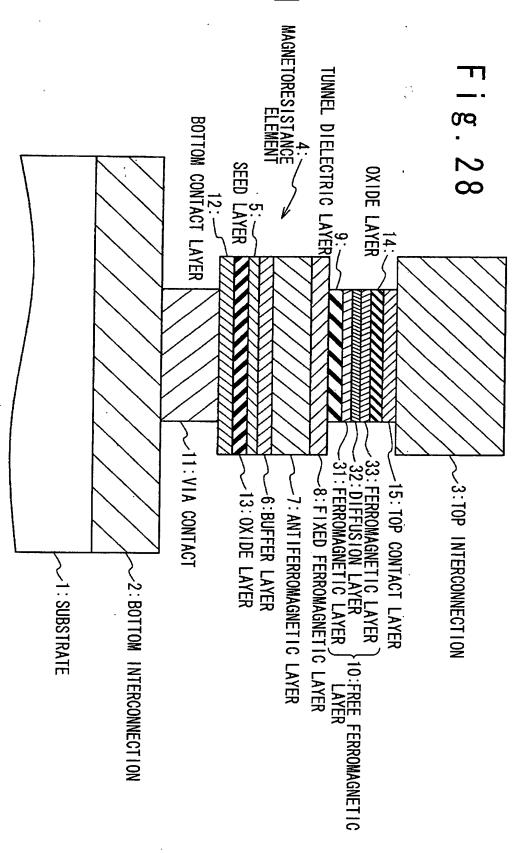
	LAYER CORRESPONDING TO CYLDE	THERMAL .	THERMAL TREATMENT TEMPERATI	TEMPERATI THERMAL	TEMPERATURE AND SATURATED THERMAL TREATMENT (emu/cc)	URATED (emu/cc)
	LAYER 14	NO	200°C	300°C	380°C	400°C
COMPARATIVE EXAMPLE 4	NO	744	736	692	455	35
COMPARATIVE EXAMPLE 5	NO	748	744	724	633	610
EXAMPLE 5	Al ₂ O ₃ (1nm)	783	787	775	771	772
EXAMPLE 6	Mgo(1nm)	775	771	775	774	773

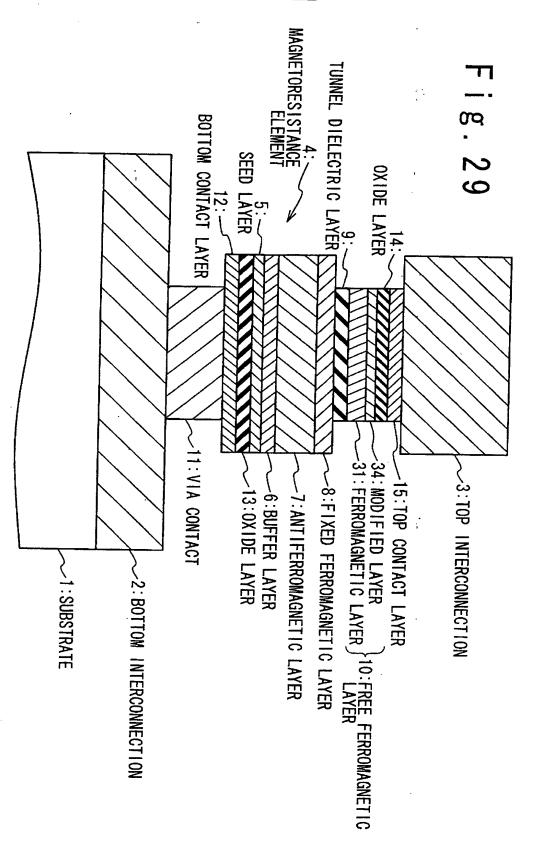
F 1 g. 25

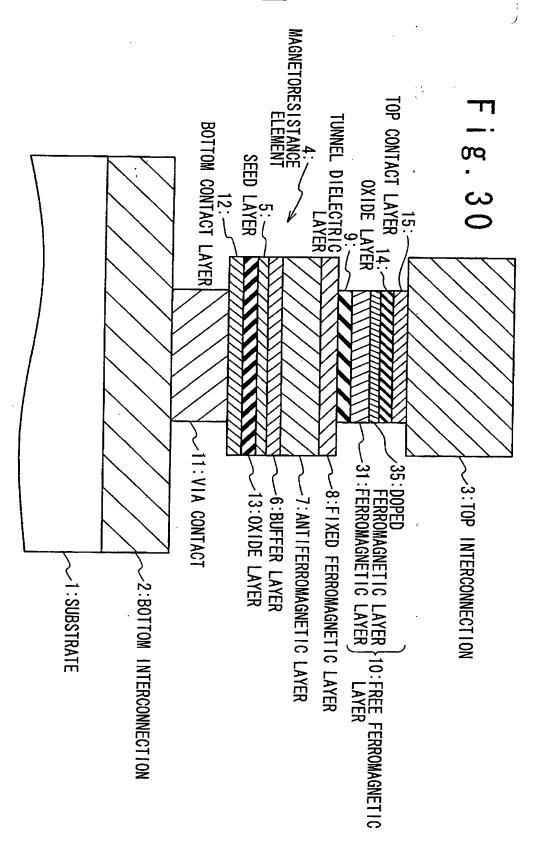
Fig. 26



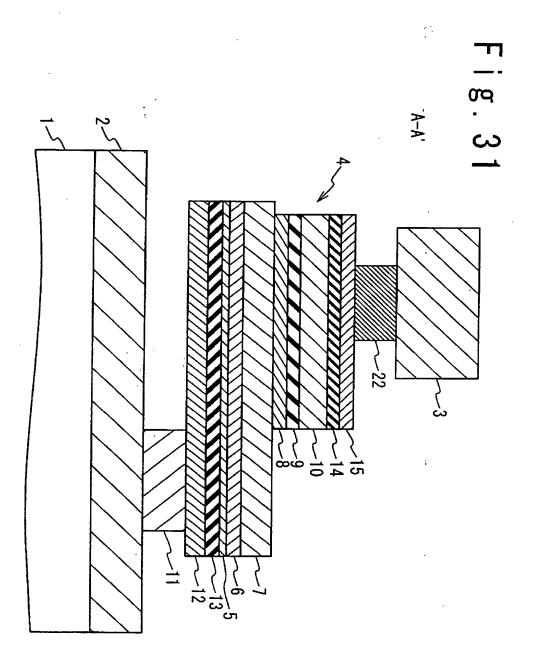








Yoshiyuki FUKUMOTO et al.
"Magnetoresistance Device and Method of
Fabricating the Same"
Q78162----Filed October 31, 2003
Sheets 31 of 40

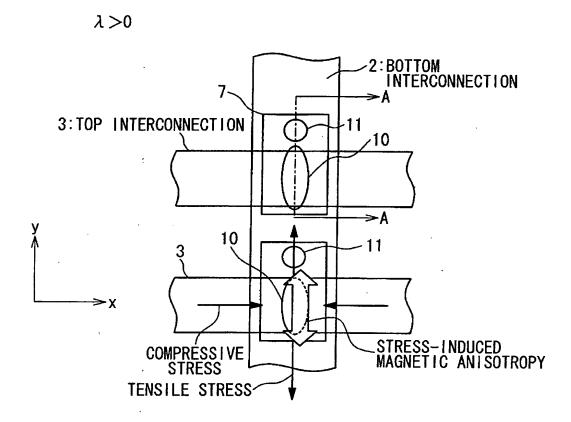


Yoshiyuki FUKUMOTO et al.

"Magnetoresistance Device and Method of
Fabricating the Same"

Q78162----Filed October 31, 2003
Sheets 32 of 40

Fig. 32



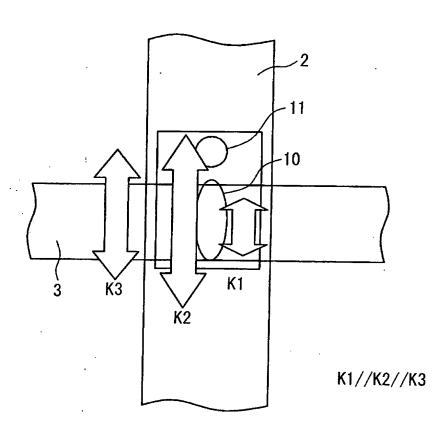
. ,

Yoshiyuki FUKUMOTO et al.

"Magnetoresistance Device and Method of
Fabricating the Same"

Q78162----Filed October 31, 2003
Sheets 33 of 40

Fig. 33

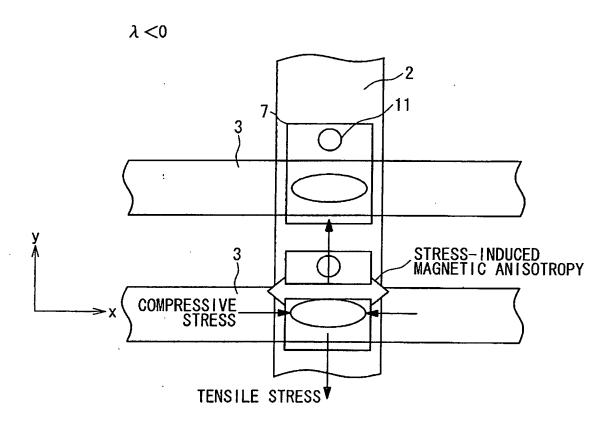


Yoshiyuki FUKUMOTO et al.

"Magnetoresistance Device and Method of
Fabricating the Same"

Q78162----Filed October 31, 2003
Sheets_34 of 40

Fig. 34



Yoshiyuki FUKUMOTO et al.

"Magnetoresistance Device and Method of
Fabricating the Same"

Q78162----Filed October 31, 2003
Sheets 35 of 40

Fig. 35



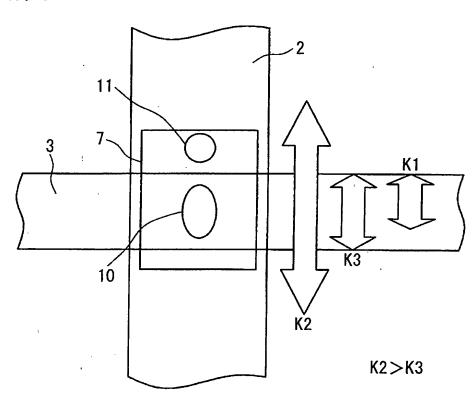


Fig. 36

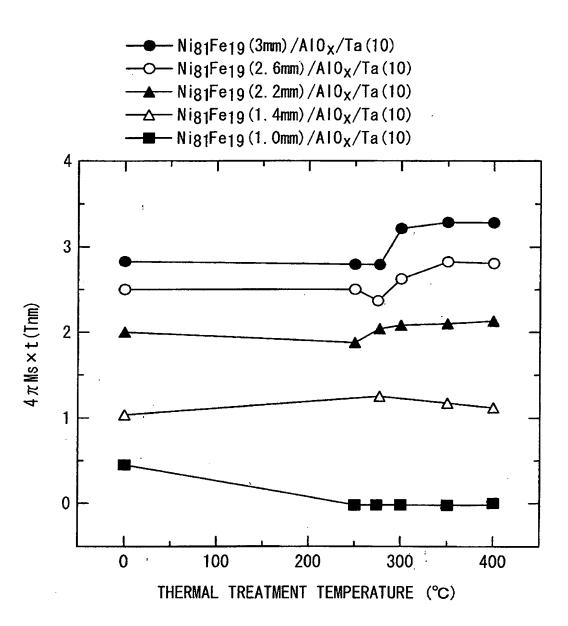
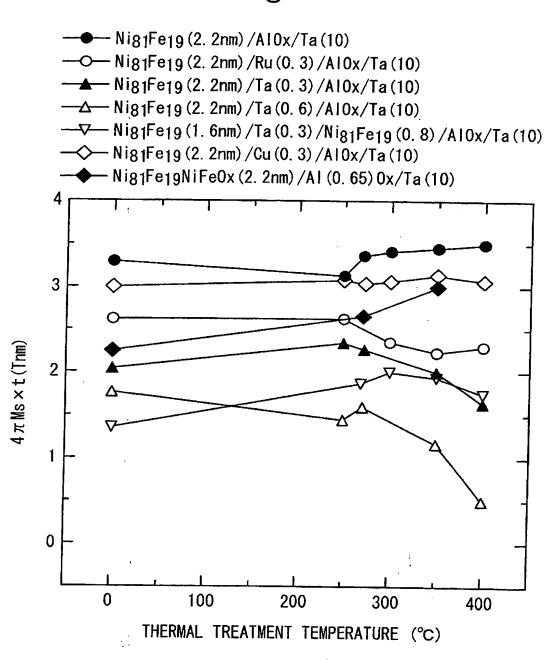


Fig. 37

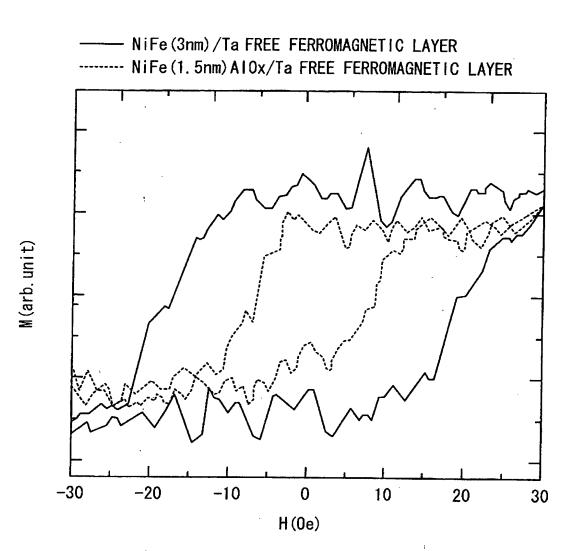


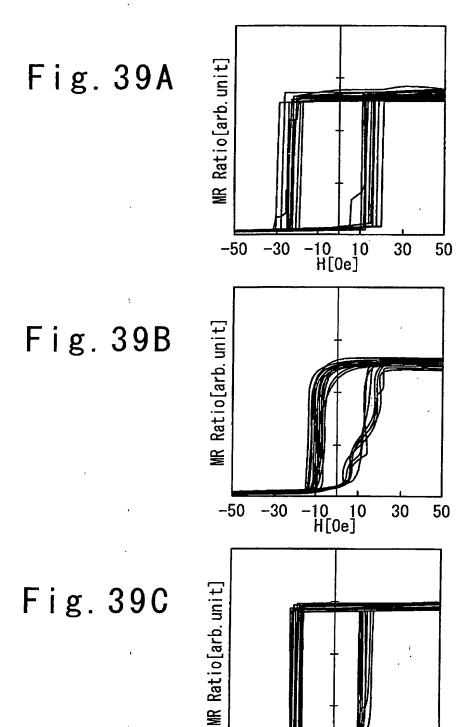
Yoshiyuki FUKUMOTO et al.

"Magnetoresistance Device and Method of
Fabricating the Same"

Q78162----Filed October 31, 2003
Sheets <u>38</u> of 40

Fig. 38





-50

-30

-10 10 H[0e] 30

50

Fig. 40

